

# METHODS AND SYSTEMS FOR PREDICTING ELECTROMAGNETIC SCATTERING

## ABSTRACT OF THE DISCLOSURE

5 Methods and systems for predicting electromagnetic scattering are disclosed. In one embodiment, a method includes covering at least a portion of an analytical model of a target with computational cells, and formulating a plurality of approximation functions. The formulating of the approximation functions includes simplifying a set of method of moments equations based on Kirchhoff's first law to provide an impedance matrix multiplied by a solution vector equated with a right hand side vector. A plurality of boundary conditions are  
10 established for the plurality of approximation functions, and the plurality of approximation functions are solved for the solution vector. The impedance matrix is deflated by a sparse transformation determined by the geometry of the scatterer, independent of material properties and frequency, subsequently reducing the computational complexity of the scattering calculation.

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